

SECTION C Descriptions and Specifications

1. The contract resulting from this solicitation shall be for the machining, welding, assembling and testing, and refurbishing / restoring of Naval Submarine Antenna, Periscope and Communication systems / components, as well as various Naval Submarine and Surface Craft's Hull, Mechanical and Electrical (HM&E) systems / components. Work may be one of a kind for prototype manufacture, equipment modification or repair, as well as limited production run manufacturing to support urgent requirements in support of the naval submarine and surface fleet.

a. As specified under authorized delivery orders issued by the Naval Surface Warfare Center, Carderock Division (NSWCCD) Ordering Officer, the Contractor shall utilize and expend the labor categories and support costs specified under the Section entitled "Supplies/ Services", herein, in support of the above effort.

b. The contractor shall provide machining / welding services on a variety of equipment and components (e.g. submarine hydraulic / hoist cylinders, submarine antenna / periscope machined parts sets, c/o the following materials (Polyethylene (ultra-high molecular weight), Rubber (ZZ-R-765 Cl. 1b, Grade 50), Nylon (MIL-M-20693), K-Monel (QQ-N-286), Teflon (MIL-P-19468), and Delrin), and various submarine and surface craft HM&E equipment / components. In addition, machined / manufactured parts may have tolerances enveloped of $\pm .001$

c. The contractor shall provide refurbishment / restoration, assembling and / or testing services of various submarine antenna / periscope faired mast assemblies, submarine antenna / periscope hydraulic / hoist cylinder assemblies and various submarine and surface HM&E systems / assemblies. Typical examples of systems to be assembled and tested include AN/BRA-34, AN/BRD-7, OE-207/BR Mast Antenna Systems, AN/BRD-7 Closure Doors, No. 1 and No. 2 Periscope Fairings, Hydraulic/ Hoist Cylinder Assemblies.

d. Examples of the systems to be machined, welded, refurbished / restored, assembled and tested are provided under the following drawing specifications:

- 1) AN/BRA-34 Antenna System (DWG SS-445-4398595)
- 2) AN/BRD-7 Antenna System (DWG SS-445-4398606)
- 3) OE-207/BR Mast Antenna System (DWG SSBN-445-4491191)
- 4) AN/BRD-7 Closure Door (DWG 150-5361661)
- 5) No. 1 and No. 2 Periscope Fairings (DWG 400-4457274)
- 6) Hydraulic Cylinder Assemblies (DWG. 2113490)

e. Each Delivery Order issued under this contract shall specify the Government's requirements and shall contain engineering drawings, detailed sketches, technical repair standards, assembly and test instructions, and detailed specification requirements in conjunction with the statements of work cited in support of the tasking efforts of paragraphs 1. b. and c., above.

f. The following machining, equipment and facilities capability must be, available for use within the contractor's site to provide the services required under this contract:

- 1) Engine Lathe

- 2) Drill Press
- 3) Milling Machine
- 4) Grinder
- 5) Vertical Boring Mill
- 6) Calibrated Layout Table
- 7) Material Handling Equipment
- 8) Welding Equipment (Solder and Brazing)
- 9) Optical Alignment Equipment
- 10) Hydrostatic Equipment
- 11) Surface Plate (able to accommodate a 23-ft Fairing)
- 12) Precise Inspection Tools
- 13) Hydraulic Power Plant possessing the following capabilities:
 - (a) Adaptability to the Hydraulic Cylinder of Mast Antenna Assembly
 - (b) Filtering System to ensure oil cleanliness to NAVSEA Technical Manual S9086-S4-STM-000/CH- 556R1
 - (c) Accelerometer Pressure Transducer and Record capable to test the Antenna Mast Assembly Hydraulic Cylinder.
 - (d) Static 5000 psi +/- 1/2
 - (e) Dynamic 2.5 gal/min @1500 psi
 - (f) Hydraulic fluid - MIL-H-17672D Navy Symbol 2075TH or 2110TH
- 14) Paint Booth
 - (a) Meeting the requirements of NAVSEA SE110-BK-MM0-010
 - (b) Capacity to paint a 23-foot long mast fairing.

15) Electrical Testing Equipment to perform the following: (i.e. Dual Sandborn Recorder)

(a) Insulation Resistance

(b) Continuity

16) Mast Antenna Assembly and AN/BRD-7 (BLD-1) Closure Door Systems Test Stands, with the following capability:

(a) The stand shall be able to interface with the above hydraulic power plant to provide pressure to the cylinder of the antenna mast assembly.

(b) The contractor shall provide the means by which a mast assembly's hydraulic Cylinder and Closure door system are cycled and tested at the designed loads.

(c) The Antenna Mast Assembly Test Stand must simulate the operation condition of the respective systems.

(1) The stand must be high enough to accommodate a full raised assembly 55-ft in height.

(2) The stand must be capable of supporting the assembly during a dynamic test as described, further, herein.

(3) The stand must be able to cycle and test the following systems as an example:

a. OE-207/BR Antenna Mast / Hydraulic Cylinder (DWG. 4491191 & 4398602)

b. AN/BRA-34 Antenna Mast / Hydraulic Cylinder (DWG. 4398595 & 2113490, 5489410)

c. AN/BRD-7 Antenna Mast / Hydraulic Cylinder (DWG. 4398606, 2113490, 5489410)

(d) The Closure Door Test Stand must be capable of testing a AN/BRD-7 (BLD-1) Closure Door (DWG. 5361661)

(1) The stand should be a mock up of the submarine bulkheads, which will be utilized to bolt the foundation and weldments for the door system.

(2) The stand shall have the capability to place a AN/BRD-7 (BLD-1) Mast Assembly and a Closure Door System. The Door System shall be able to Cycle a full Closure.

17) The contractor must possess the following test equipment and specialized services, or be able to demonstrate the ability to obtain such:

(a) Services of a laboratory approved by NSWCCD for reporting oil contamination, in accordance with NAVSEA Tech Manual S9086-S4-STM- 000/Ch-556R.

(b) Mechanical and optical equipment suitable for obtaining straightness and alignment readings for the required assemblies/subassemblies and their relationship to each other when assembled as a system. An alignment scope with auto-collimation capabilities and suitable fixture are required inspection tools.

18) The contractor shall have an assembly area large enough to assemble a 23-Ft Mast Fairing, a 17.5 Ft Hydraulic Cylinder with a 16 Ft Stroke and a 17 Ft Antenna. The area should be able to accommodate at least three (3) concurrent assemblies.

19) The contractor shall have a Hydraulic Assembly Area, with positive pressure inside used to provide an environment to minimize contamination and is isolated from machine shop dust and abrasives.

g. Example of Antenna Mast / Hydraulic Cylinder Testing Requirements:

1) Pre-operational Steps:

(a) Clean filters and strainer to assure that hydraulic fluid is kept at a level of cleanliness as outlined in the applicable drawing and NAVSEA Technical Manual S9086-S4-STM-000/CH-556R1.

(b) Re-circulate oils for five minutes and check cleanliness.

(c) Position mast / hydraulic cylinder in test stand and secure base.

(d) Mast Bearing Frames must be in alignment to each other and to the centerline of the Hoist Cylinder Base.

(e) Adjust Mast Bearing for proper operating clearance.

(f) Ensure that the wire rope cables are adjusted and secured.

(g) Connect Hydraulic Lines to base.

(h) Operation Test (50 cycles required):

(1) All bearings and mast bearings surfaces shall be water lubricated during dynamic cycle tests.

(2) Record type of hydraulic oil used.

- (3) Record pressures (pressure variation not to exceed $\pm 1/2\%$ plant pressure).
- (4) Take six up cycle time - record average.
- (5) Take six down cycle time - record average.
- (6) Take two (2) oil samples from supply to raise and lower.

h. Example of Mast Alignment:

- 1) The center of the 2.500" to 2.502" diameter hole of the hoist cylinder mounting bracket shall be located within .025" of the mast fairing hoist cylinder centerline and shall be perpendicular within .005" per foot of the mast fairing hoist centerline.
- 2) The center of the steady bearing bracket bore diameter shall be located within .025" of the mast fairing hoist cylinder centerline and shall be machined in accordance with applicable specifications.
- 3) The mast fairing bearing areas shall be straight within .040" with maximum variation in any one foot increment of no greater than .010"; two measurements shall be taken of each bearing area:
 - (a) One (1) before assembly
 - (b) One (1) upon completion of assembly.
- 4) An alignment scope with auto-collimation capabilities and suitable fixtures are required inspection tools.

i. Example of Assembly & Test Procedures / Instructions:

- 1) A step by step assembly and test procedure (developed by the contractor), meeting the Governments requirements, as indicated under any such order.
- 2) All bearing shoe surfaces for the Inner Mast and Upper / Lower Bearings, shall show a 50% minimum contact uniformly distributed with mating or sliding surfaces.

j. Example of Dynamic Test for Antenna / Hydraulic Cylinder Assembly:

- 1) Assembly and testing equipment required to test the antenna / hydraulic cylinder assemblies will be furnished by the contractor.
- 2) To simulate the actual operating conditions in an installed configuration, a dynamic test shall be performed to obtain the following results:

(a) Adjust mast speed to 8"-12" per second. Raise and lower the piston rod at 1500 psi plant pressure.

(b) Pressure variations during cycling shall not exceed $\pm 1/2\%$ of plant pressure. Each assembly shall be cycled fifty (50) times.

(c) Dashpot action is not to exceed 0.5 "G's" on upper and lower dashpot. Recorder is to run at a speed of 100 mm per second for dashpot recordings.

(d) Post operational inspection shall be performed before removing the antenna assembly from the test stands. With the antenna assembly in the raised position, inspect the following:

(1) Condition of Hydraulic Cylinder exterior surface.

(2) Condition of Inner Mast/Radome exterior surface.

(3) Condition of exposed portion of hoisting and lowering cable.

k. Example of Antenna Mast Loads:

- 1) A Government Furnished Material (GFM) Radome / Inner Mast Antenna will provide the loads to simulate operation configuration for the Antenna Mast Assemblies.
- 2) The loads to simulate configuration shall range from 350 lbs. to 1500 lbs., for the antenna mast assemblies.

1. The above are typical examples, only: any variation to the above requirements shall be specified under individual delivery orders.

2. In support of the requirements specified under paragraphs 1.a. through 1.l. above, the contractor shall utilize Personnel, as cited under the Supplies / Services section contained herein, meeting the following minimum requirements:

Machinist:

Able to set-up and operate those machines, tools and equipment and make precise alignment and complex set-ups of the work pieces on those drawings listed under paragraph 1. A. through 1.l., above. Able to work from blueprints and specifications of in-process and finished piece parts. Utilizes shop mathematics to make necessary calculations.

Welder:

The contractor must have available services of a qualified welder in accordance with NAVSEA Publication S9074-AQ-GIB-010/248. Contractor is also required to have written and approved welding procedures in accordance with NAVSEA S9074-AR-GIB-010/278. All welding will

require approved non-destructive test procedures in accordance with NAVSEA T9074-AS-GIB-010/271 and MIL-STD-2035.

Mechanic (Limited):

Performs trade, craft and manual duties that are of a level between helper and journeymen mechanics. Limited mechanics require the performance of less skilled tasks in the trade under general supervision, coupled with the performance of higher skilled tasks under close supervision. Tasks typically include repair, maintenance, fabrication and assembly for which the job layout, work sequences and material requirements have been previously determined by a higher level employee. Such duties require familiarity and skill in the use of tools, equipment, machines of the trade, but the employee is given detailed instruction and close guidance when new or unusual tasks are assigned.

Test Mechanic:

Work requires broad trade knowledge of mechanical principles, hydraulics, machining of metals and trade mathematics. Specialized experience is required through apprenticeship or its equivalent, i.e., machinery. Disassembles, repairs, and rebuilds machinery, tests repairs and realign parts as necessary. Adjusts and sets various controls. Performs machining of parts and makes test operations of machinery.

Quality Inspector:

Ability to read, interpret and apply technical data such as blueprints, engineering drawings, product specifications, technical manuals, and contract statements of work. Able to verify by test or inspection, using sampling inspection or intensive product inspection techniques, that products comply with specification requirements.

3. In addition to the above personnel, the contractor shall utilize and expend the services of a Packer / Shipper for each delivery order requiring such. Packaging / Shipping shall be in accordance with the requirements contained under the Packaging / Marking section contained, herein.

4. The contractor shall also expend the following Support costs under any resulting delivery order requiring such:

a. The contractor shall furnish materials in response to the performance of machining, welding, assembling and testing tasks required under this contract, and shall be reimbursed under the Material contract line item contained under the Supplies / Services section, herein. Unless otherwise specified the contractor shall furnish all materials, including raw material required for performance of the services. Each delivery order shall explicitly describe any / all Government Furnished Material to be provided to the contractor in support of the tasking requirements identified under such order.

b. The contractor's costs for pick-up / delivery of items in conjunction with the tasks performed under any such delivery order shall be reimbursed under the Transportation contract line item contained under the Supplies / Services section, herein. For the purpose of evaluating this solicitation, costs shall be based on a Round Trip basis.

c. The contractor may require the services of a sub-contractor to provide specialized services, in support of defined tasks under authorized delivery orders. An example of these services are (e.g. plating utilizing electrolytic processes, honing or grinding of lengths in excess of 20ft, control welding of SUBSAFE/ Level 1 material, etc.). Such services shall be reimbursed under the Sub-contractor contract line item contained under the Supplies / Services section, herein.

d. The contractor may require the services of a laboratory (approved by NSWCCD) for testing and reporting oil contamination under any delivery order, as applicable. The laboratory shall be capable of testing for oil contamination in accordance with NAVSEA 59086-54-STM-010-CH-556. Such services shall be reimbursed under the Oil Sample Testing contract line item contained under the Supplies / Services section, herein.

5. Technical Data

The technical data to be delivered (for the contract and any resulting delivery order) shall be furnished as required by the applicable DD Form 1423.

Contractor Progress / Status Report – as specified under the DD1423 of this contract, shall be provided on a monthly basis at the end of each month, and shall include information detailing a listing of all delivery orders, hours and funds utilized / remaining under the entire contract as well as each individual delivery order and the current status of tasking requirements, percentage of work completed / remaining and items delivered for each order.

Additional Facilities:

The contractor's facilities shall have the capability to maintain four (4) segregated storage areas, each free of mercury contamination:

- 1) Government Furnished Material**
- 2) SUBSAFE / Level I Material**
- 3) Non-Conforming Material**
 - 3) Classified Material (Secret / Confidential)**

QUALITY ASSURANCE REQUIREMENTS

1. Contractor's Quality/Inspection System:

a. The contractor shall provide and maintain a written inspection system, which will assure that all supplies and services submitted to the Government for acceptance conform to contract requirements

whether manufactured or processed by the contractor, or procured from subcontractors or vendors. The contractor shall perform or have performed the inspections and tests required to substantiate product conformance to drawing, specifications and contract requirements and shall also perform or have performed all inspections and tests otherwise required by the contract. The contractor's inspection system shall be documented and shall be available for review by the Naval Surface Warfare Center Carderock Division – Philadelphia Site, Naval Business Center, Bldg. 29, Phila., PA 19112-5083, Attn. Code 9613, via the assigned Contract Administration Office (CAO), fifteen (15) days after award of contract and throughout the life of the contract. The contractor shall notify the Naval Surface Warfare Center Carderock Division – Philadelphia Site in writing of any change to the inspection system. The inspection system shall be subject to disapproval if changes thereto would result in nonconforming product. Vendors currently operating under ANSI/ISO/ASQ Q9001-2000 or MIL-I-45208 quality system will be deemed acceptable under this provision.

b. The Quality/Inspection System shall include the following:

- 1) Document Control
- 2) Purchasing
- 3) Control of Customer Supplied Material (Government Furnished Material)
- 4) Product Identification and Traceability
- 5) Process Control
- 6) Inspection and Testing
- 7) Inspection Measuring and Test Equipment Calibration in accordance with the requirements of ANSI/NCSL Z540-1 or ISO 10012-1.
- 8) Inspection and Test Status
- 9) Control of Nonconforming Product
- 10) Corrective Action
- 11) Handling, Storage, Packaging, and Delivery
- 12) Records
- 13) Control of SUBSAFE, and Level I Material.
- 14) Controls to assure sub-contractors comply with contract quality system requirements.
- 15) Special Requirements identified in Delivery Orders.

2. Procedures:

a. The contractor shall furnish the following procedures, as specified under any applicable order, 15 days prior to the performance of any applicable test:

1) An inspection plan. This document shall contain as a minimum:

- a) Step-by-step method with inspection/verification points.
- b) Part Name.
- c) Identification of each characteristic to be inspected.
- d) Acceptance and reject criteria.
- e) Actual dimension recordings.

2) Straightness test procedure, and / or optical alignment procedure. The

procedure shall contain as a minimum:

- a) Straightness Requirements.
- b) Alignment Requirements.
- c) Equipment List.
- d) Step-by-step Method.
- e) Set up.
- f) Method of Obtaining Readings.
- g) Reading Locations on the Unit.
- h) Recording of Test Results.

3) Dynamic Test Procedure

4) Hydrostatic Test Procedure.

- a) Test Requirements.
- b) Set up of Unit in Test Stand.
- c) Applied Loads.
- d) Step-by-step Method.
- e) Applied Cycle.
- f) Recording of Test Results.
- g) Time Periods for Cycling.

5) Cycle Test Performance Procedure

6) Electrical Tests.

7) Flexure Test Procedure as required by Drawing and/or other Specification.

8) Nondestructive Test Procedures in accordance with NAVSEAT9074-AS-GIB-010/271 for:

- a) Dye Penetrant

- b) Radiography
 - c) Ultrasonic
 - d) Magnetic Particle
 - e) Visual.
- 9) A written welding procedure and welder Qualification data in accordance with NAVSEA S9074-AR-GIB-010/278.
- 10) For HY-80/100/130 material, written welding procedure and welder Qualification data in accordance with NAVSEA T9074-AD-GIB-010/1688
- 11) Weight/Holding capacity test for mast clamps.
- 12) Special Requirements identified in Delivery Orders.

3. Records:

- a. For each assembly, component, delivered item, the supplier shall furnish one (1) copy of the following documents correlated to the contract number and serial number assigned to the assembly, as specified under any applicable order:
 - 1) For Government-Furnished Material:
 - a) Certification that material furnished was used in the assembly it was supplied for.
 - b) Document list of all material used in such furnished assembly. For each piece, the list shall include the drawing number, piece number, and component serial letter.
 - 2) For Contractor-Furnished Raw Material:
 - a) For contractor-supplied material, the contractor shall supply documented verification of raw material by alloy families using simple, direct and rapid analysis methods or a combination of methods (e.g., visual, hardness test, magnetic properties test, acid spot tests, and metal comparator tests).
 - b) For the UHMW polyethylene material the contractor shall provide:
 - (1) A Certificate of Compliance attesting that the material is homogeneous, free of streaks defect free, and stress relieved.
 - 3) Copies of qualifications of personnel performing welding under this contract in accordance with NAVSEA S9074-AQ-GIB-010/248.

- 4) Test reports showing the results of non-destructive testing inspections. Report must include joint identification, plan number, piece number, compliance to NAVSEA T9074-AS-GIB-010/271 for procedures used, and show acceptance to:
 - a) Visual Inspection of Welds - MIL-STD-2035.
 - b) Dye Penetrate Testing - MIL-STD-2035
 - c) Magnetic Particle Testing - MIL-STD-2035.
 - d) Ultrasonic Testing - MIL-STD-2035.
 - e) Eddy Current Testing - MIL-STD-2035.
 - f) Radiographic Tests of Welds - MIL-STD-2035.
 - g) Radiographic Tests of Castings - NAVSHIPS 0250-692-1300.
 - h) Radiography Testing of Castings - NAVSHIPS 0250-692-9010.
 - (1) Radiographic film must be marked in relation to contract number, serial number, and location of the film on the part being tested. Film must be accompanied by a shooting sketch and an acceptance statement signed by a Government qualified reader.
- 5) Copies of current qualifications to NAVSEA T9074-AS-GIB-010/271 for personnel performing and evaluating the results of non-destructive test.
- 6) Copies of test reports showing the results of:
 - a) Hydrostatic Pressure Testing.
 - b) Dynamic Testing.
 - c) Cylinder Cycling Test Performance
 - d) Optical Alignment
 - e) Straightness Inspection
 - f) Weight/Holding capacity test
 - (1) Insert pullout test under Drawing 28528-1362435. This test is to be accomplished prior to installation of piece 1.
 - (2) Insert pullout test under Drawing SS-128-4491148 and SPI #3059. This test is to be accomplished prior to installation of piece 28.
- 7) The inspection records shall show the results of every dimension inspected and shall include

the inspector's signature and date. The inspection records are to be maintained on Objective Quality Evidence Data Sheets (OQEDS) supplied by the contractor. Recording the results of dimensional inspections on a configuration facsimile of the component as shown on the applicable drawing is an acceptable OQED.

a) ACTUAL measurements are required for the following characteristic:

- (1) Dimensions with a tolerance of +/- .005 or less"
- (2) Straightness of .010" per foot or less
- (3) Geometric characteristics (forms, profile, orientation, location, run out, etc.) with a tolerance of .010" or less
- (4) Finishes 32 or less.
- (5) Angles +/- 1/2 degree or less
- (6) Torque Records

b) Class 2 Threads shall be inspected in accordance with ASME B1.3, System 21 requirements and Class 3 threads or higher shall be inspected in accordance with ASME B1.3, System 22 requirements.

c) Sampling inspection is permitted under this contract. A sampling plan identifying the parts and the sample size must be submitted to NSWCCD-Phila code 9613 for approval prior to completion of inspection.

d) Certification of stress relieving for pieces requiring stress relief.

e) Certification of age hardening for pieces requiring age hardening.

f) Electrical test reports as required by Drawing or Specification.

g) Complete copies of NSTM S9086-S4-STM-000 table 556-29A for reporting results of oil contamination by an approved laboratory.

h) Complete inspection report showing the results of visually inspecting O-rings used in the assembly. This report shall have attached the individual O-ring packages that the O-rings were supplied in and shall show the cure date of each O-ring.

i) All of the supplied documents shall have complete traceability to the hardware for inspection purposes. Therefore, whenever applicable, records shall show: contract number, name of contractor, plan number, revision letter, piece number, serial letter/number of finished piece, item nomenclature, material degree of control, and MIC number if SUBSAFE, or Level I.

j) Documented list of all material used in each finished and delivered

assembly. A qualification summary sheet that will summarize and correlate all of the Objective Quality Evidence to support product quality. The contractor will supply certifications summary sheet blanks, used by the contractor.

- k) Records for each assembly, component, delivered item shall identify the inspection, measuring, test equipment, calibration dates and calibration due dates for inspection, measuring, and test equipment used during verifications, inspections, and/or tests.
- l) Inspection Forms: Contractor shall utilize the following inspection forms for reporting test data:
 - (1) NSWCCD Form 104-17-016, Mast Fairing Dimensional Straightness Measurement.
 - (2) NSWCCD Form 104-15-032, Auto Reflection for Piston Rod Brackets and Cylinder Bearings
 - (3) NSWCCD Form 104-17-029, Inner Mast Dimensional and Straightness Measurements
 - (4) NSWCCD Form 104-17-030, Mast Sigma Channel and Aft Internal Bearing Straightness
 - (5) NSWCCD Form 104-03-019, Mast Performance Test
 - (6) NSWCCD Form 104-18-017, Hoist Cylinder Straightness
 - (7) NSWCCD Form 104-18-018, Cylindrical Components Straightness
 - (8) NSWCCD Form 104-11-023, Hoist Cylinder Hydrostatic Test
 - (9) NSWCCD Form 104-11-041, Hoist Cylinder Assembly Performance Test
 - (10) NSWCCD Form 104-11-042, Periscope Hoist Cylinder Hydrostatic Test
 - (11) NSWCCD Form 104-11-043, Periscope Fairing Hoist Cylinder Hydrostatic Test
 - (12) NAVSHIPS 4646
 - (13) NAVSHIPS 4647
- m) Special Requirements identified in Delivery Orders.

4. Control of Government Furnished Material (GFM):

- a. Material received from NSWCCD Philadelphia will be received accompanied by NSWCCD Philadelphia Material Control Form 154-04-036.
- b. NSWCCD Philadelphia will be responsible for completing Material Control upon issue of the material.
- c. Upon receipt of material, contractor will inventory material and return two (2) copies of the completed form to NSWCCD Philadelphia, Code 9633.
- d. A complete inspection report of visual and dimensional inspections of the GFM conducted by the contractor shall be forwarded to NSWCCD-9613 prior to using the GFM.
- e. Material traceability must be maintained at all times from material to the Material Control Form.
- f. Excess material or spoilage is to be returned to the government.
- g. Government-Furnished Equipment shall be returned in good and usable condition. If repairs are required, the cost of repairs shall be charged to the contractor.
- h. Special Requirements identified in Delivery Orders.

5. Mercury Exclusion Clause

a. Mercury Contamination: The supplies furnished under this contract shall contain no metallic or mercury compounds and shall be free from mercury contamination (i.e., during the manufacturing process, testing, or inspecting) or shall be on the List of Mercury-Containing Material/Equipment approved by NAVSEA, enclosure (1) of NAVSEAINST 5100.3C. Any material/ equipment so listed shall have label plates as prescribed in enclosure (3) of NAVSEAINST 5100.3C. The supplies offered shall not have come in direct contact with mercury or any of its compounds nor with any mercury-containing device employing only a single boundary of containment. (A single boundary of containment is one, which is not backed by a seal or barrier.) Mercury contamination of the supplies will be cause for rejection of the material.

b. If there is reasonable cause to suspect the supplies of being contaminated by mercury, the following test may be used to determine whether contamination by metallic mercury exists: Enclose the equipment in a polyethylene bag or close-fitting airtight container and place in an oven at 135 degrees F \pm 5 degrees F for one hour. Sample the trapped air and if mercury vapor concentration is 0.0 mg/cu meter or more, the material is mercury contaminated insofar as the requirements of this contract are concerned. Mercury vapor concentration can be determined with a mercury vapor detector such as a portable General Electric Vapor Detector (Catalog No. 8257557G-3), Bechman Instrument Model K-23, or other instruments that have equivalent range and capabilities. It should be noted that certain vapors such as benzene interfere with this type of mercury vapor detector and the detector should never be zero adjusted in any suspect atmosphere.

c. If the inclusion of metallic mercury or mercury compounds is required as a functional part of the material furnished under this contract, the contractor shall obtain written approval from NAVSEA before proceeding with manufacture. The contractor's request shall explain in detail the requirement for mercury, identify specifically the parts to contain mercury, and explain the method of protection against mercury escapes. Such a request will be forwarded to the Government Inspector or Government Representative with a copy to NAVSEA. Upon approval by NAVSEA, the vendor will provide a warning plate as prescribed by enclosure (2) of NAVSHIPSINST 5100.28 which will include a statement that mercury is a functional part of the item and also the name and location of that part.

d. If and to the extent that this contract calls for work to be performed by the contractor on a submarine, the contractor, in connection with such work, shall not bring into or utilize in the submarine any instrument or other device containing metallic mercury or mercury compounds, unless such equipment, instrument, or device has been approved by the Naval Sea Systems Command or authorized representative for use on a submarine.

e. The contractor is required to certify via a certificate of compliance that:

- 1) The supplies furnished under this contract contain no metallic mercury or mercury compounds.
- 2) The contractor has taken responsible steps to ensure that the supplies furnished under this contract are not contaminated with metallic mercury or mercury compounds.

f. The requirements of this clause shall be included in all subcontracts hereunder. Technical question pertaining to the requirements of this clause shall be referred to NAVSEA via the Government Inspection or Representative.

6. SUBSAFE, and Level I Requirements

a. The component(s) to be supplied under this specification is (are) in a hull integrity application aboard Navy submarines. The materials utilized shall be manufactured under strict quality control procedures to ensure compliance with all invoked specifications.

b. The contractor shall contact NSWCCD Code 9613 in writing after award of contract and prior to commencement of any work to ensure all SUBSAFE prerequisites are addressed and to arrange for the delivery of the NSWCCD SUBSAFE \ Level I Material stamp.

- 1) The SUBSAFE, and Level I material is as identified by drawings or in Delivery Orders.
- 2) For contractor supplied "SUBSAFE," and "Level I" raw material, the contractor shall supply original (mill) certification reports of physical properties and chemical composition traceable to material by heat number in compliance with DID-MISC-81020.

3) The contractor shall mark SUBSAFE and Level I raw material with the heat number. Items too small to mark must be bagged and tagged. Traceability must be maintained from the raw material to the finished part.

- a) Prior to applying any special finishes to final machined parts and prior to final assembly of component parts, the contractors shall contact NSWCCD Code 9613 to arrange for the semi-quantitative analysis material swipe to be performed by NSWCCD Code 9613 on the finished SUBSAFE component.
- 4) Material Identification Control (MIC) numbers shall be assigned by NSWCCD-9613. Each finished component will be delivered identified with drawing number, piece number, component serial number, and MIC number if "SUBSAFE" or "Level I" material. The contractor may not alter or remove the MIC number once applied.
- a) MIC marking of the SUBSAFE or LEVEL I component(s) or assembly must be accomplished in the presence of a representative from NSWCCD 9613 or the delegated CAO representative.
 - b) The MIC number must remain associated with the material at all times. The finished component must be permanently marked in accordance with MIL-STD-792.
- 5) Material supplied as GFM shall be processed in accordance with the following provisions:
- a) Document all material used in such furnished assembly. For each piece, the list shall include the drawing number, piece number, component serial letter, Heat/Lot number and MIC number.
 - b) Raw material will be permanently marked with MIC number if the end use is for "SUBSAFE" or "Level I" material.
 - c) If material is subdivided, the MIC number shall accompany each segment.
 - d) MIC numbers will be permanently transferred to all surplus material.
- 6) Certification: The contractor shall submit the following certification data:
- a) Certification of welding electrodes used shall be furnished. This includes chemical and mechanical properties, manufacturer control number, heat number, type, and size. Additionally, a sample of the weld electrodes shall be supplied to NSWCCD-9613 for quantitative analysis prior performing any welding on a SUBSAFE component.
 - b) K-Monel Material Properties - Furnish a quantitative report of test results conforming to the applicable specification.
 - (1) Nickel-Copper-Aluminum Alloy, K-500 material per FED SPEC QQ-N-286, used in the fabrication of parts to be provided for SUBSAFE or Level I application, shall be produced by INCO Alloy International, Inc. and substantiated by material certification from the vendor. (Reference Document: NAVSEA letter 4400, Ser 3931/4204 of 2 Dec, 1991).
 - c) Verification of the correctness of material fasteners shall conform to the

requirements of MS18116, MIL-S-1222.

d) Verification of Assembly - A torque record reflecting actual torque applied and lubricant used when drawing, or special notes specify such records.

- (1) For all other instances, the vendor will provide a certificate of compliance attesting to conformance with all drawing and specified requirements.
- (2) SUBSAFE/Level I components removed from equipment/assemblies/subassemblies must be identified and documented.
- (3) SUBSAFE/Level I components installed into equipment/assemblies/subassemblies must be identified and documented.
- (4) O-rings utilized in SUBSAFE/Level I assemblies/subassemblies/piece parts must be documented, reporting the type O-ring used, results of visual inspection of O-ring, cure date, and quantity used.

e) Verification of Dimensions – The contractor is required to certify via a certificate of compliance that all dimensions, threads, angles, and finishes comply with drawings or specification requirements. All approved deviation/waivers shall be listed as part of the certificate of compliance.

f) Verification of Electrical Test - The contractor is required to certify via a certificate of compliance that all electrical tests comply with drawings or specification requirements.

g) Soundness - Radiographic inspection to all castings associated with pressure hull boundary and subject to sea pressure in the primary and secondary boundary to be in accordance with NAVSEA S9074-AR-GIB-010/278 Dye penetrate or magnetic particle inspection of all castings subject to above radiographic inspection in accordance with NAVSEA S9074-AR-GIB- 010/278. Submit approved radiographic standard shooting sketch, radiographic inspection report, and radiographic film for each casting radiograph, inspection report of dye penetrate and/or magnetic particle inspection, and qualification report for each NDT inspection.

h) Traceability shall be maintained between the material and its quantitative test reports through a unique traceability number, heat-lot number, or heat-treat number as applicable, which shall also be marked on the material. Control must be established to retain this number in association with the material during machining. This traceability number marked on the material shall provide direct traceability to the materials chemical composition and mechanical property certification data.

i) SUBSAFE assemblies with non-metallic within the SUBSAFE Boundary and joints shall be identified and controlled in accordance with applicable specifications and drawings. Identification shall be product description, national stock number, and/or material specification.

- (1) Traceability shall be provided for raw ingredients used to manufacture all SUBSAFE non- metallic parts and components.

7) Storage - All "SUBSAFE", and "Level I," material shall be segregated from other material.

a) "SUBSAFE" material shall be segregated from "Level I" material.

c. Verification/Summary:

1) Stamps: The NSWCCD SUBSAFE/Level I Material stamp shall be applied to all Objective Quality Evidence Reports for SUBSAFE/LEVEL I, SUBSAFE, or LEVEL I material. The contractor shall fill in the applicable information.

2) Material Verification: The contractor shall make available all SUBSAFE/Level I finished parts for material verification including hardness testing and semi-quantitative analysis.

3) A summary sheet that will summarize and correlate all of the Objective Quality Evidence to support product shall be supplied.

7. Containers for SUBSAFE / Level I equipment will be marked with "SUBSAFE/Level I on sides and front.